SOIL SURVEY OF THE CAMPOBELLO AREA, SOUTH CAROLINA.

By A. W. MANGUM and ALDERT S. ROOT.

LOCATION AND BOUNDARIES OF THE AREA.

The area surveyed embraces parts of Spartanburg and Greenville counties, S. C., and is situated along the border line in the northwestern part of that State. The total number of square miles surveyed was about 515. The east and south boundaries of the whole area extend due north and due west from the city of Spartanburg. The western boundary extends from a point 32 miles west of Spartanburg due north

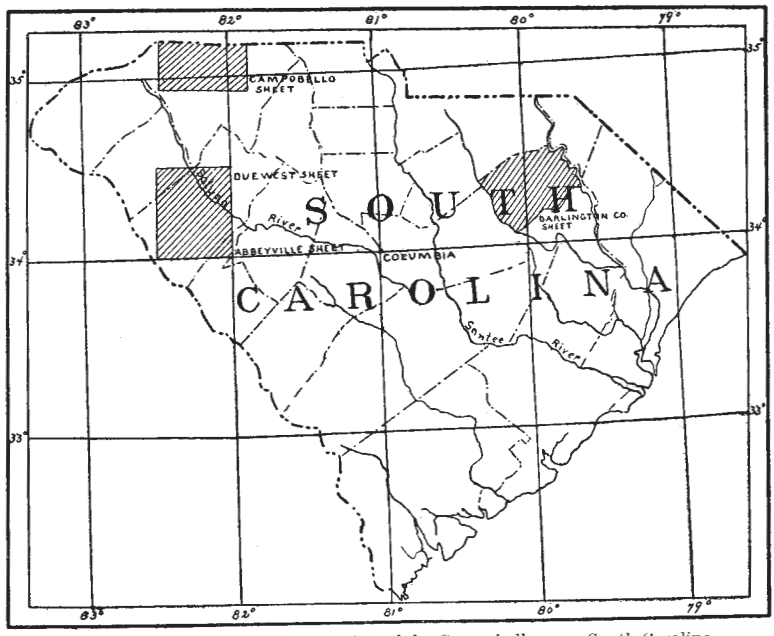

FIG. 11.—Sketch map showing location of the Campobello area, South Carolina.

to the North Carolina line. The northern boundary is formed by the line between North and South Carolina.

The northern fourth of the area lies in the Saluda Mountains, while the remainder extends upon the Piedmont Plateau.

The area lies between 34° 58′ and 35° 13′ north latitude and 81° 56′ and 82° 30′ west longitude, extending 32 miles east and west and varying from 15 to 18 miles in width north and south.

HISTORY OF SETTLEMENT AND AGRICULTURAL DEVELOPMENT.

The part of the country in which lies the Campobello area was in the hands of the Cherokee Indians until the year 1775. By a compact made with them that year by Governor James Glenn, very nearly half the present territory of South Carolina was ceded by them. The opening of this new and fertile country attracted many settlers, chiefly from Virginia, but many also from North Carolina, Maryland, and Pennsylvania, as well as from Great Britain and the Continent. While this part of the State was still in the hands of the Indians, Col. Edgar Clark, of North Carolina, with eight or ten Scotch-Irish families from Pennsylvania, made the first settlement near what is now the city of Spartanburg. This was in 1764, and these people formed the total white population of Spartanburg County until it was vacated by the Indians.

At first the settlements were along the stream courses, where the lands were more productive and easily cleared. The streams also served as a means of transporting the products of the farms and surrounding forests to the lower settlements. Larger tracts of land were soon cleared up, and the population steadily increased by continued immigration. Communication with the outside world was yet difficult, so that all the necessities of life had to be obtained from the farms and forests.

With the settlement of the upper country small grain was sown with more success than had attended its culture in the lowlands, and the excellent grinding facilities soon made possible the exportation of flour in some quantity. In 1802 cotton began to attract attention as a farm product, but the prevailing low prices, compared to cost of production and heavy cost of transportation, kept it from becoming a staple crop.

The two great factors in the development of the country were railroads and cotton manufacture. No steam road traversed the area until about 1840, but with its advent new sections of the country were opened to settlers and a better means of travel and transportation was given to the older districts. The railroad in running along the upland ridges established small towns and settlements in the thinly settled portions between the streams. These small towns became centers of trade; and an easy means of importing necessities and of exporting the products of the farms being furnished, more attention was given to the culture of cotton and other money crops. The old rough highways were soon replaced by a large number of well-kept roads leading from the towns to the surrounding country.

In the decade from 1870 to 1880 the manufacture of cotton in South Carolina developed rapidly. Each year saw a large increase in the number of mills, especially where good water power could be obtained.

The many small rivers in the area furnished such power in abundance, and up to the present day the number of mills along these streams has steadily increased. Small towns have sprung up around the cotton mills, and these furnish a ready market for the produce of the surrounding country, increasing the value of the land and the demand for conveniently situated farms.

CLIMATE.

There is a noticeable difference in the climate of the northern and of the southern extremes of the area. The northern portion lies well up in the mountains, and the difference in altitude gives it a later spring and earlier fall than is experienced in the vicinity of Spartanburg. The effect of this can be easily seen in the cultivation of cotton. In the extreme northern part the crop is scarcely attempted at all, and the certainty of a profitable yield in the Piedmont region varies directly with the distance from the mountains.

In the southern and central portions of the area the climate is mild and healthful. An early spring and late fall, with little snow during the winter, insure a long growing season.

The following table, compiled from Weather Bureau records, shows the normal annual and monthly temperature and precipitation as observed at Clemson College and at Walhalla, S. C. The difference in the altitude and climatic conditions between these localities and the main part of the area surveyed are so slight that the data given in the table are representative.

Normal monthly and annual temperature and precipitation.

Month.	Clemson College.		Walhalla.		Month.	Clemson College.		Walhalla.	
	Temperature.	Precipitation.	Temperature.	Precipitation.		Temperature.	Precipitation.	Temperature.	Precipitation.
	°F.	*Inches.*	°F.	*Inches.*		°F.	*Inches.*	°F.	*Inches.*
January	41.4	4.66	42.7	4.14	August	76.0	4.23	76.0	4.93
February	40.8	4.68	45.7	4.33	September	70.2	4.06	70.5	5.73
March	48.6	3.67	50.5	6.78	October	63.1	3.10	59.6	3.40
April	54.0	3.06	59.5	5.70	November	51.2	3.21	49.6	3.41
May	68.8	3.06	67.6	2.94	December	42.5	3.54	44.3	2.98
June	77.6	4.56	76.2	4.92	Year	59.4	48.01	59.9	55.88
July	78.9	6.18	76.5	6.62					

There are certain local differences in climate not indicated by the table. The high mountains naturally have a lower mean temperature, and that section of the Piedmont just south of these mountains is more or less affected by proximity to them. The prevailing winds are from the east and west. No data of the occurrence of killing frosts in the area were obtainable.

PHYSIOGRAPHY AND GEOLOGY.

The northern part of the area is crossed by the Saluda chain of the Appalachian Mountains. This section is very rugged, the mountains rising suddenly from the comparatively level plains of the Piedmont Plateau and often reaching an elevation of 2,500 feet above sea level. Many of these mountain slopes are too steep for cultivation, but the valleys along the stream courses are usually wide enough for farming purposes and are the most valuable lands in the region. The mountains, as a rule, have their steeper slopes to the south and east, the northern and western slopes often being gentle enough to permit the use of plows.

The prevalent rock is a coarse-grained granite, which often lies very near the surface, and which, by rapid disintegration of the feldspar, forms a coarse gray sand, grading at slight depth into the partially decomposed rock. Hornblendic and other varieties of gneiss and mica schists containing many quartz veins occur, especially in the foothills of the higher range, and from these the mountain soils are formed. Many streams rise in these mountains and plunge by a series of small falls and cascades to the more level country only a few miles to the southward, where they unite to form the small even-flowing rivers which traverse the area.

Notwithstanding the steepness of the mountain slopes, the cultivated lands seem to suffer very little from erosion. The porosity of the soils, the excellent drainage afforded by the small streams, and the large amount of land still covered by the original forest growth all serve to protect the cultivated lands from extreme erosion. The country just south of the higher range, though broken and hilly and traversed by a large number of swift mountain streams, is seldom of so rugged a nature as to be without agricultural value. Both the higher mountains and the foothills are covered with a luxurious growth of hardwood forest, chestnut, oak, hickory, and poplar predominating.

The streams in this section offer excellent water power, but owing to the inaccessibility, the lack of railroads, and the poor mountain roads it is not used except for the few local gristmills.

From the mountains the great Piedmont Plateau, which in this State includes the whole of eight counties and parts of several others, stretches away to the southward. The northern part of the Piedmont region, in which the remainder of the area surveyed lies, presents a gently undulating plain, which becomes more broken and hilly as it approaches the mountains.

The elevation of the plateau in the area surveyed averages about 1,000 feet above sea level. The streams flow smoothly between low, rounded hills, the valleys and bottom lands being much wider than those of the country to the north. The rock formations are very

similar to those of the mountain section, though they have been broken down and worn away in the leveling process which has been going on for ages. Observations made in wells and deep cuts show that the soil depth upon the parent rock varies from 25 to 50 feet. The rocks themselves, consisting for the most part of granites and gneisses, become coarser grained as they reach the mountains, often having the appearance of conglomerate. They are among the oldest of rocks.

Seven small rivers traverse the area, forming an excellent drainage system. Six run in a southeasterly course and empty into the Broad River, while the other follows a southwesterly course, finally swinging around to the south and meeting the Broad to form the Congaree. Excellent water power is afforded by these streams.

SOILS.

Eight types of soil, exclusive of rock outcrop, were recognized in the area, seven of which were residual soils, being formed directly from the decomposition of the underlying rocks. These types and the areas occupied by each are shown in the following table:

Area of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Cecil clay	187,443	56.9	Cecil sand	2,086	0.6
Cecil sandy loam	85,888	26.0	Rock outcrop	1,997	.6
Porters sand	15,238	4.6	Cecil stony loam	1,805	.5
Porters sandy loam	13,267	4.0	Total	329,420	.....
Porters clay	13,005	3.9			
Meadow	8,691	2.6			

CECIL CLAY.

The Cecil clay is the most important type of soil in the area, both in extent and agricultural value. As found here it varies from a stiff clay to a red clay loam having a stiff, tenacious red clay subsoil. The surface soil, in its typical form as recognized in this survey, consists of a red clay loam, 0 to 10 inches deep, usually having quartz fragments scattered over the surface and through the soil. The subsoil is a stiff red clay, differing from the soil in having a greater clay content and less organic matter. It often reaches a depth of from 20 to 30 feet before the parent rock is encountered.

Cecil clay is a residual soil, being derived directly from the underlying granites, gneisses, and schists. It is the main upland type, occupying the flat uplands and rolling hills of the area, and it is often found on the steeper slopes along the stream courses. This type is the best in the area for general farming purposes. It resists both the leaching and erosive action of the heavy rains, and fertilizers used on it have a lasting effect. The value of land of this type is dependent to

some degree upon its location, ranging from $10 an acre in the sections more remote from the railroads to $25 or $30 an acre near the towns. Where properly cultivated, and where rotation with leguminous crops is practiced, it gives good yields of grain. It resists erosion better than the more sandy soils, and yet is porous enough and the drainage is sufficient to allow cultivation within a reasonable time after rains. In a dry season this type has a tendency to bake, forming a hard, bricklike surface of so compact a nature that the plant roots can not penetrate it easily. This detriment to growth has been successfully overcome by the plowing under of some leguminous crop, thus adding more humus to the soil. East of Campobello this type is found of so stiff a nature that it is properly cultivated with difficulty.

When well cultivated, wheat on this soil will yield an average of 12 or 15 bushels an acre; oats, 20 or 25 bushels; corn, 15 bushels, and where special care is taken much larger yields have been obtained. In the cultivation of cotton this type gives the best yield in a wet season, often producing a much larger yield than the sandy loam. It will average from one-half to three-fourths bale per acre. When the soil is not of too stiff a nature it is considered a good cotton soil, though the crop is usually later than that planted on the sandy loams, since it can not be planted quite as early in the spring. Apples do well on this type, especially in the northern part of the area, but no orchards of any great extent exist at present.

The Cecil clay resists erosion, retains its productiveness with the application of a minimum amount of labor and fertilizer, and is adapted to almost any crop suited to the climate of the area. Its location on the rolling uplands assures good drainage. Its principal forest growth is hardwood, oaks, hickory, and poplar predominating.

The following table gives the mechanical analyses of typical samples of the fine earth of this soil:

Mechanical analyses of Cecil clay.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
8744	6 miles W. of Gowensville.	Red clay loam, 0 to 10 inches.	1.46	3.70	11.68	11.18	25.18	9.90	11.50	26.06
8746	1½ miles S. of Tigerville.	Red clay loam, 0 to 6 inches.	1.40	6.30	13.64	12.94	21.24	7.78	8.60	29.40
8745	Subsoil of 8744.....	Stiff red clay, 10 to 36 inches.	1.12	1.50	7.70	8.00	16.70	6.50	9.90	49.50
8747	Subsoil of 8746.....	Stiff red clay, 6 to 36 inches.	.69	2.46	7.48	5.20	8.30	3.90	6.90	65.50

CECIL SANDY LOAM.

The Cecil sandy loam is second of the important types of the area. It consists of a gray sandy loam, 0 to 12 inches deep, overlying a stiff red clay subsoil, similar to the subsoil of the Cecil clay. It occurs in small patches in all parts of the area surveyed and near the center, in Holly Springs Township, covers about 8 square miles.

This soil is also an upland type, occupying the more level uplands and gentle hill slopes. It is well drained by the many small streams, but is easily damaged by the erosive action of rains, especially upon hillsides. This soil also is residual, being derived from the underlying granites, schists, and gneisses. The sand is of medium grade and angular, and numerous quartz fragments are found scattered on the surface. The subsoil, from 12 to 36 inches, is a stiff red clay, becoming stiffer and more tenacious as the depth increases. The Cecil sandy loam differs from the Cecil clay only in having a larger sand content in the first few inches.

This soil is easier to cultivate than the clay soil, but the effect of fertilizer is not as lasting, and it requires more attention and frequent fertilization to keep it in a high state of productiveness. Yet it is a good type of farming land and is valued, according to its location, at from $8 to $25 an acre. The Cecil sandy loam is better adapted to cotton than the Cecil clay in a dry season. The subsoil retains enough water to supply the crop, and, unlike the Cecil clay, no hard, bricklike crust is formed on the soil by drought.

The average yield of cotton is one-half bale to the acre, but when well cultivated and fertilized a bale to the acre is often produced. This soil is well adapted to the sweet potato, producing a larger and sweeter product than the stiff clay loams. Corn also does well, yielding from 10 to 25 bushels to the acre. Wheat and oats give smaller yields than when sown on the clay. Peanuts, tomatoes, and Irish potatoes are successfully cultivated. The natural forest growth is a mixture of pine and hardwood, the pine being more in evidence than on the Cecil clay.

When well terraced and properly cultivated this type of soil produces large yields of most of the general farm products of the area. Owing to its light, warm character, crops get an earlier start than on the clay soil. Terracing is now being practiced extensively on the hillsides and slopes, and as a consequence erosion in the sandy loam and the deposition of the wash from this type along the stream courses is being greatly retarded.

The following table gives the mechanical analyses of typical samples of this soil:

Mechanical analyses of Cecil sandy loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
8750	¼ mile S. of Tigerville.	Gray sandy loam, 0 to 10 inches.	1.33	7.60	20.54	13.74	21.94	11.94	11.90	11.98
8752	4 miles N. of Campobello.	Gray sandy loam, 0 to 10 inches.	.85	6.30	22.52	15.52	23.02	7.94	10.70	13.80
8751	Subsoil of 8750....	Stiff red clay loam, 10 to 36 inches,	.42	3.80	12.16	8.16	14.26	7.88	11.14	42.50
8753	Subsoil of 8752....	Stiff red clay, 10 to 36 inches.	.41	6.10	11.84	7.74	13.16	5.36	9.82	45.80

CECIL SAND.

The surface soil of the Cecil sand, from 0 to 15 inches, is a light-gray sand. The sand is angular and of a coarser grade than is usual in the Cecil sandy loam. A large number of quartz fragments are scattered through the soil and on the surface. At a depth of from 12 to 20 inches the sand grades into a yellow sandy clay. The clay content gradually increases, and the material becomes redder in color with the depth.

This type occurs on the more level uplands and on gentle slopes along small streams. Only in a few localities does it occur in large enough areas to be mapped, although in the southern part of the area it is frequently found covering an acre or so.

The Cecil sand, also, is a residual soil, being derived from fine-grained granite and gneiss. It is considered a poorer soil for general farming purposes than the Cecil sandy loam, and, owing to the porosity of the subsoil, requires frequent fertilization to keep it in a productive state. The texture, together with the location, also makes the type less susceptible to destructive washing, and it requires less terracing than the other upland types.

Where it is properly cultivated it gives fair yields of cotton, corn, and oats. Wheat does not do so well on this as upon the other upland soils of the Piedmont region, though a fair yield is obtained by careful cultivation. At present there is no attempt to cultivate bright tobacco, though in other areas the type is recognized as a good bright-tobacco soil. It is a fine soil for watermelons.

Under ordinary conditions, when well fertilized, the average yields per acre of the staple crops grown on this type are as follows: Cotton, one-half bale; corn, 8 bushels; oats, from 15 to 20 bushels; and sweet potatoes, 150 bushels. The forest growth is similar to that on the Cecil sandy loam—a mixture of hardwoods and pine.

The following table gives the mechanical analyses of typical samples of this soil:

Mechanical analyses of Cecil sand.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
8762	5 miles S. of Highland.	Very sandy loam, 0 to 15 inches.	0.47	7.80	17.12	14.08	35.94	12.46	7.60	4.90
8760	2½ miles NW. of Spartanburg.	Sandy loam, 0 to 15 inches.	.76	6.20	9.90	9.96	36.20	17.14	11.70	9.70
8761	Subsoil of 8760.....	Yellow clay loam, 15 to 36 inches.	.61	2.88	6.26	7.66	29.06	14.16	9.44	30.42
8763	Subsoil of 8762.....	Yellow clay, 15 to 36 inches.	.37	4.20	9.20	6.70	20.00	6.80	11.30	41.70

MEADOW.

The soils classed as Meadow occupy areas lying along the stream courses, locally known as "bottom lands." In only a few cases are these soils too wet for cultivation, though they are rapidly becoming so on account of the filling up of the stream courses and the resulting frequent overflows.

The soil is composed of material taken up in times of heavy rains and deposited by the streams when they reach a flatter part of the country. It is often formed of layers of sand, gravel, and clay, but varies in composition in different localities, few areas of any size being similar, and each one being modified with every flood or overflow of the stream. Lands which but a few years ago were the most productive of the region are now covered with from 6 to 36 inches of coarse sand, and their value is steadily decreasing. The type is cultivated mainly to corn, and often yields from 40 to 60 bushels per acre. Limited experiments have indicated that the soil is well adapted to rice, and some excellent returns have been realized. Cotton will yield on the average two-thirds bale to the acre where the bottom is well drained and the soil well cultivated. Wheat and oats are seldom tried on the type, as the stiffer clay soils of the uplands are so much better suited to their cultivation.

The filling up of the stream courses and consequent destruction of the valuable lands is a serious problem in the area. In many localities it is impossible to drain the bottoms, as they are at present lower than the stream beds. Some of these lands, which formerly sold for $100 an acre, are now valued at $20 or $25 an acre.

CECIL STONY LOAM.

The Cecil stony loam is a gray to grayish-brown sandy loam or loam, 0 to 6 inches deep, underlain by a reddish clay loam which becomes a stiff red clay at a depth varying from 10 to 20 inches. The surface is covered by rock fragments ranging in size from small gravel to bowlders of several feet in diameter, and forming a very large percentage of the soil mass. The soil itself has a large quantity of fragmental rock scattered through it, making it difficult to cultivate. Partially disintegrated rock fragments and small fragments of pure quartz are also encountered in the subsoil. "Ironstone," granite, schists, and quartz are the varieties of rock seen in this type.

This soil does not occur in any large areas, but extends in narrow strips and small oblong areas in the north-central part of the area surveyed. It occurs on the ridges between streams and on the steeper slopes of the rounded hills. It is excellently drained, lying as it does on the upland ridges, and yet retains water well, which enables it to withstand a drought better than any of the other upland soils. Where practicable the larger stones are removed from the surface in order to make cultivation less difficult.

The Cecil stony loam is derived from masses of granite, quartz, and schists that lie usually at no great depth below the surface, and often protrude above the surface in large, fixed bowlders.

In the Campobello area this soil is considered especially adapted to cotton, giving a larger yield with less expenditure for fertilizers than any other type. Farmers say that it will yield on the average 350 pounds of lint cotton to the acre. The soil is too rocky to allow the extensive use of modern agricultural machinery. A very small plow is used to scratch the surface to the depth of a few inches, the large number of stones prohibiting deep plowing. Corn does not do well on this type, yielding only 8 or 10 bushels to the acre in a good season. It is too stony for the successful cultivation of wheat or other grain. The soil seems to be very well adapted to the culture of grapes and other fruits, but at present there are no orchards or vineyards of any extent in the area. The typical forest growth consists of chestnut, oak, dogwood, and hickory, in which are scattered a few pines.

The following table gives mechanical analyses of typical samples of the fine earth of this soil:

Mechanical analyses of Cecil stony loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
8758	1 mile W. of Landrum.	Red loam, 0 to 10 inches.	1.48	4.70	13.12	15.42	29.54	9.24	10.88	16.40
8756	2 miles N. of Boiling Springs.	Loam, 0 to 6 inches.	2.61	10.10	13.52	10.42	21.64	11.32	12.90	19.80
8759	Subsoil of 8758....	Red clay, 10 to 36 inches.	.41	3.10	8.12	9.32	17.74	5.74	10.00	45.80
8757	Subsoil of 8756....	Stiff red clay loam, 6 to 36 inches.	.84	1.90	5.38	4.82	12.58	10.48	11.66	53.10

PORTERS CLAY.

The surface soil of the Porters clay is a red clay loam from 0 to 8 inches deep, usually containing a small amount of mica. The subsoil from 8 to 15 inches is a red clay loam containing small quartz and mica particles. This material grades at a depth of from 12 to 20 inches into a stiff red clay, which usually extends 8 or 10 feet below the surface before reaching bed rock.

This type occupies small areas along the foothills and lower slopes of the mountains in the northern part of the area. The natural drainage of the soil is good, but great care is required to protect it against gullying. Terracing is necessary, except where it occupies the flat valleys along the stream courses.

The Porters clay is a residual soil originating directly from disintegration of granite, gneiss, schist, and other altered rocks. It is a characteristic Appalachian Mountain soil. It is the strongest type of mountain land found in the area, requires less attention to keep it productive, and suffers very little from the leaching action of the large rainfall in this locality.

The characteristic timber is a heavy growth of hardwood; oak, hickory, chestnut, and poplar being most abundant. Wheat, cotton, corn, oats, and some fruit are produced on this type. When the seed bed is properly prepared and well fertilized wheat gives good yields, often producing 25 bushels to the acre, but the average yield ranges from 10 to 12 bushels. Corn yields from 12 to 15 bushels to the acre, and under better cultivation than is usual much larger yields could be obtained. Oats yield 20 bushels to the acre, while cotton, in a good season, seldom brings over half a bale to the acre. Porters clay is not

well adapted to cotton culture, as, because of its mountainous location, the growing season is shorter and the climate too cool for the crop to mature properly. The soil is excellently adapted to fruit. When it lies upon the sunny southern slopes of the mountains peaches and grapes do well, while apple orchards on the cooler northern slopes are very successful.

Porters clay holds the same relation to the mountain soils as Cecil clay does to those of the Piedmont Plateau, being recognized as the best type of general farming land in the mountainous section and well adapted to any crop suited to the climate. Practically no grass is grown, though the soil would give good yields. This may be due to the lack of demand, since stock raising is not an industry in the area.

The following table gives the mechanical analyses of this soil:

Mechanical analyses of Porters clay.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
8768	3 miles SW. of Humphreys.	Red clay loam, 0 to 6 inches.	0.76	5.20	14.92	10.32	19.92	10.84	12.48	26.10
8766	Saluda Mountains.	Red clay loam, 0 to 7 inches.	.59	4.20	11.44	8.54	18.46	10.26	13.60	33.30
8769	Subsoil of 8768....	Stiff red clay, 6 to 36 inches.	.32	4.40	14.10	9.30	17.10	8.70	11.90	34.70
8767	Subsoil of 8766....	Stiff red clay, 7 to 36 inches.	.25	5.00	11.34	7.64	15.64	8.14	14.50	37.60

PORTERS SAND.

The Porters sand is the poorest type of general farming land found in the area. It consists of a coarse gray sand, 8 inches deep, overlying a coarse-grained sandy material which grades into decomposed rock at a depth of from 3 to 5 feet below the surface. The subsoil contains large particles of decomposing rock, which can be easily crushed between the fingers.

This soil occupies the steep mountain slopes and the flat tops of the higher mountains, and in certain sections, as on Glassy Mountain, in South Carolina, extends over large areas. The type is what is locally known as "ivy land," a thick growth of mountain ivy usually covering it. When first cleared it will often produce one or two average crops, but as soon as the accumulation of organic matter is exhausted the yields obtained are very small. This is a light, porous soil, through

which the rain water soaks rapidly, and it seldom washes badly and does not need terracing. Roads through this soil are always in good condition, compact, and yet well drained. The drainage of the type, owing to its location only on steep mountain slopes, is always good.

The soil has been derived from the disintegration of a coarse-grained pegmatite granite, and gneiss. The feldspar in these rocks decomposes easily, leaving the coarse quartz grains but loosely held together. The parent rock is often very near the surface, and is in such a state of decomposition that there is no distinct line of demarcation between the rock and the subsoil. This decayed granite often extends to a depth of 6 feet before it is stable enough to resist pressure between the fingers.

Commercial fertilizers are never used on this type, since it is believed they would leach out at once. The use of stable manure and the addition of humus to the soil by plowing under green crops has been successfully tried.

When first cleared the Porters sand will produce 12 to 15 bushels of corn to the acre, but after a year or so the yield will not average more than 8 or 10 bushels. Large yields of cornfield beans are always obtained, and when sown on sunny slopes cowpeas are a very profitable crop. The type is especially adapted to fruit, and good crops of apples, peaches, and grapes are obtained from the small orchards located on it. Grapes seem to do especially well on this soil, but owing to the distance of a suitable market no attempts to set out commercial vineyards have been made.

The following table gives the mechanical analyses of typical samples of this soil:

Mechanical analyses of Porters sand.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
8774	Saluda Mountains	Porous sand, 0 to 7 inches.	0.54	8.60	16.54	16.04	38.66	13.56	3.10	2.72
8772	2 miles NW. of Landrum.	Gray sand, 0 to 8 inches.	1.12	11.60	26.60	14.60	21.80	7.60	8.50	9.30
8776	Glassy Mountain.	Sand, 0 to 6 inches..	3.06	14.68	24.36	11.36	18.76	10.26	8.94	11.30
8775	Subsoil of 8774....	Coarse and medium sand, 7 to 36 inches.	.41	6.50	19.30	13.50	33.30	14.90	7.20	5.50
8777	Subsoil of 8776....	Coarse and medium sand, 6 to 36 inches.	.36	17.60	29.10	14.66	19.96	8.18	4.70	5.90
8773	Subsoil of 8772....	Coarse and medium sand, 8 to 36 inches.	.25	16.90	29.88	14.88	20.08	7.16	4.70	6.46

PORTERS SANDY LOAM.

The surface soil of the Porters sandy loam is a gray sandy loam 10 inches deep, very similar to the Cecil sandy loam of the Piedmont Plateau. The sand is coarse to medium in grade and angular, and there is a large quantity of quartz fragments scattered through it and lying on the surface. The subsoil is a stiff red clay, similar to that of Porters clay and extending to a depth of from 5 to 15 feet before encountering the underlying rock.

The Porters sandy loam covers small tracts in the northern part of the area. It occurs on the slopes of the mountains. This is the typical sandy loam of the southern Appalachians and is an important type of general farming land. Like the other types it is a residual soil and it is derived from similar rocks, though as a rule they are of a finer grain than those forming the Porters sand. The soil varies considerably in depth and is deepest on the lower slopes of the mountains and foothills, especially near the small streams. The drainage is good.

The characteristic timber is hickory, oak, poplar, and pine. Owing to the stiff red clay subsoil, the type does not leach easily and with care can be kept in a high state of productiveness. The sandy soil has a tendency to wash off the steeper slopes, thus leaving the red clay subsoil exposed, but by careful terracing this washing can be prevented.

This soil is considered as well adapted to corn and fruit. Cotton, on account of location, does not give large yields. Wheat and oats when cultivated on the southern slopes give fair yields, but where grown on the cool, shady northern slopes these crops suffer from rust and mildew, which seem to be favored by an excess of cool moisture. The soil seems to be excellently adapted to peaches. No large orchards are at present located in the area, but the possibilities in this industry can be estimated from the flourishing condition of the small orchards at present in the section.

The crops grown and average yield per acre are given by the farmers as follows: Corn, 10 to 15 bushels; wheat, when located on a sunny slope and properly cultivated, 10 to 12 bushels; oats, 20 to 25 bushels; potatoes, 40 to 60 bushels. There is very little manure and no fertilizer used on this type in the area surveyed.

The following table gives the mechanical analyses of typical samples of this soil:

Mechanical analyses of Porters sandy loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
8780	NW. of Lima.....	Sandy loam, 0 to 8 inches.	1.49	6.70	24.14	16.58	26.48	9.20	8.40	8.50
8778	NW. of Landrum.	Gray sandy loam, 0 to 8 inches.	4.99	8.10	19.86	12.36	22.22	10.66	14.70	12.20
8782	S. side of Glassy Mountain.	Gray sandy loam, 0 to 7 inches.	1.22	5.76	16.22	12.72	26.16	14.88	11.60	12.52
8783	Subsoil of 8782....	Stiff red clay, 7 to 36 inches.	.88	5.40	14.60	9.20	22.94	10.80	17.30	19.70
8781	Subsoil of 8780....	Red clay, 8 to 36 inches.	.57	5.36	19.62	10.18	14.54	8.84	16.72	24.56
8779	Subsoil of 8778....	Clay, 8 to 36 inches.	1.04	6.00	13.28	7.86	16.68	11.28	18.40	26.50

ROCK OUTCROP.

Areas indicated on the map as Rock outcrop represent lands that are too steep and rocky to be of any agricultural value. They occur mostly on the higher mountains, from which the soil has been swept down to the lower slopes, leaving the bare rocks exposed. In other cases the slopes are too steep and too completely covered with large bowlders to allow cultivation.

AGRICULTURAL CONDITIONS.

Though the history of the area under discussion dates back to 1775, very little real development took place till within the last few decades. With no transportation facilities, it was too remote from centers of trade to make much progress, but fertile soils and a favorable climate offered settlers a hopeful future, so that the population slowly but steadily increased and agricultural interests prospered in proportion. The increase in population and value of property has been rapid since the advent of the cotton-milling industry.

The fact that there now exists among the farmers of this section a strong tendency to give more attention to the cultivation of a few acres rather than to spread their energies out over many acres indicates one step in the progress of agriculture, although as yet no actual intensive methods of farming are used.

The farms in the area range in size from 10 to 150 or more acres, averaging approximately 100 acres. About one-third of the average farm is under cultivation—that is, from 30 to 40 acres.

In the northern part of the area, along the North Carolina line, the rough character of the country, together with the large amount of rocky lands, makes farming almost impracticable, and the farming class in this locality is, as a rule, very poor. Farther south a more prosperous condition exists, and around Spartanburg and Greenville the best chances of success are open to the farmer, since he has a ready market for his products and the transportation facilities are adequate.

The class living among the mountains is placed at a great disadvantage as far as agricultural development is concerned, for, in addition to the fact that the growing season is shorter and the soils are not as deep or productive, the transportation of products to market long distances over the rough mountain roads is very difficult.

The well-to-do class of farmers live in neatly constructed frame houses, generally of one but occasionally of two stories. For the most part each farmer owns the land he cultivates, and there is not much farming done on shares. Except in the vicinity of Spartanburg, very little negro labor is employed, due chiefly to the fact that it is difficult to procure, now that better opportunities are offered in the towns.

The crops produced are chiefly corn, cotton, wheat, and oats, while sorghum, peanuts, potatoes, and small quantities of tobacco are grown for domestic use. On bottom lands classed as Meadow, corn flourishes better than on any other type, yielding from 30 to 60 bushels to the acre. For wheat and oats the Cecil clay is the best type of land in the area. It also gives larger yields of corn than any of the other upland soils. The greater part of the cotton is produced on the Cecil sandy loam, which yields from one-half to two-thirds bale to the acre. This type gives larger yields in a dry growing season than any of the other types, as the subsoil retains enough water to adequately supply the crop, and, besides, the surface does not bake in dry weather, as is the case with the Cecil clay. In a wet season the Cecil clay soil often produces a crop equal to or better than those produced on the Cecil sandy loam or Cecil sand, since the cotton on the first-named type never suffers from what is locally known as "drowning out."

The Cecil sand is largely devoted to cotton culture, but with less success than on the stronger types; nor is this type very good for wheat and oats.

Some of the soils of the area are well adapted to the production of tobacco, and the growing of this staple may eventually become an industry, since some interest is beginning to be manifested in it. Along the stream courses and river bottoms experiments have shown that rice can be successfully grown, but the area suitable for this crop is very limited.

Rotation of crops is a phase of successful farming that is almost entirely neglected in the area. Frequently a field is cultivated con-

tinuously in corn or cotton for years before a change is made. But few patches of leguminous crops—peas and clover—are seen. The farmers seem to be indifferent to the great advantages to be derived from a more extensive use of these crops. Most of the soils are well adapted to either one or the other of these legumes, and their introduction in rotation with cotton, corn, and wheat would not only insure larger yields of each than are now realized, but also would aid in the permanent betterment of the soil.

One of the most serious problems confronting the farmers living along the stream courses is the gradual filling up of the stream beds and consequent accumulation of water and deposition of sand by floods upon the adjoining bottom lands. The deforesting of large areas along the headwaters of the streams and the gradual increase of cleared lands cause an immense amount of material to be washed down into the streams. Where the stream beds were once deep and the lowlands along their courses were the most valuable lands in the surrounding country, they are now shallow and sandy, and many of the bordering meadows are covered with a layer of coarse sand, which is added to at every heavy rain. In many places the bottoms are but a few feet above the stream level, and water accumulates in such quantities as to render the land practically worthless.

This destruction of valuable land can be greatly checked and the condition of a great part of the damaged land can be immensely improved by keeping the stream courses free from obstructions and by removing shoals of sand when possible. Trees are often cut and allowed to fall across the streams; logs and other obstructions lodging against them finally cause the channel to fill up and widen. The fall of the streams in the area is such as to allow the stream channels to be considerably deepened, and if the larger obstructions were removed they would soon be cut down to a depth that would permit the draining of most of the lowlands. Terracing the cultivated hillsides is becoming a common practice in the area, and its importance in successfully preventing the excessive washing of lands, especially of the sandy loams, can scarcely be overestimated.

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U.S. DEPT OF AGRICULTURE
BUREAU OF SOILS
MILTON WHITNEY CHIEF

SOIL MAP

SOUTH CAROLINA
CAMPOBELLO SHEET

SOIL PROFILE
(3 feet deep)

Cecil stony loam — Ssc, Scc, C
Porters sand — Ssc, S
Porters sandy loam — Ssc, C
Cecil sand — Ssc, C, S
Cecil sandy loam — Ssc, C
Cecil clay — Ssc, C
Porters clay — Scc, Scc, C
Meadow

LEGEND

Ssc Sandy loam
Scc Clay loam
C Clay
S Sand
Sand and clay

LEGEND

Cs Cecil stony loam
Ps Porters sand
Pl Porters sandy loam
Ds Cecil sand
Cl Cecil sandy loam
Cc Cecil clay
Pc Porters clay
M Meadow
Rock outcrop

NORTH CAROLINA
SOUTH CAROLINA
BOUNDARY LINE
GREENVILLE SPARTANBURG

Landrum
Gowensville
CAMPOBELLO
Fingerville
Jaman
Campton
Lima
Highland
Tigerville
Pleasant Hill
Oneal
Belview
Locust Hill
Tray
Fair Forest
Spartanburg

Pacolet River
Middle Pacolet River
South Pacolet River
North Tyger River
South Tyger River
Enoree River
Broad River
Green Creek
Jamison Creek
Easley Creek
Motlow Creek
Rosen Creek
Beaverdam Creek
Buff Creek
Tarrys Gap Creek
Tull Creek
Lawsons Fork
Southern Railway

82°30′ 20′ 10′ 82°00′
35°00′

Soils surveyed by
A.W. Mangum and Albert S. Root
1903.

Scale 1 inch = 1 mile

Field Operations
Bureau of Soils
1903